

NEW STATUS FOR *EPIBLEMA MINUTANA* (KEARFOTT) AND
NEW SPECIES OF *EPIBLEMA* HUBNER AND
SONIA HEINRICH (TORTRICIDAE)

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ABSTRACT. *Epiblema minutana* is a distinct species, differing from *E. strenuana* (of which Heinrich considered it a synonym) in size, wing shape, male and female genitalia. *Epiblema luctuosana* is described from southern and eastern Texas. *Sonia paraplesiana* n. sp., widely distributed in the eastern United States, has long been confused with Zeller's *Sonia constrictana* known only from south Texas and south Florida.

Epiblema minutana (Kearfott) revised status

Eucosma minutana Kearfott 1905, Proc. U.S.N.M. 28: 356.

Eucosma antaxia Meyrick 1920, Exot. Microlepid. 2(2): 344.

Epiblema strenuana (Walker 1863) Heinrich 1923, U.S.N.M. Bull 123: 140.

Remarks. My interest in this problem was aroused when my wife and I took on North Padre Island, Texas, in March and again in June 1978, a series of specimens of an *Epiblema* which in Heinrich's key (1923, p. 137) keyed out at *strenuana*, but which, after examination of the female genitalia proved to be definitely different.

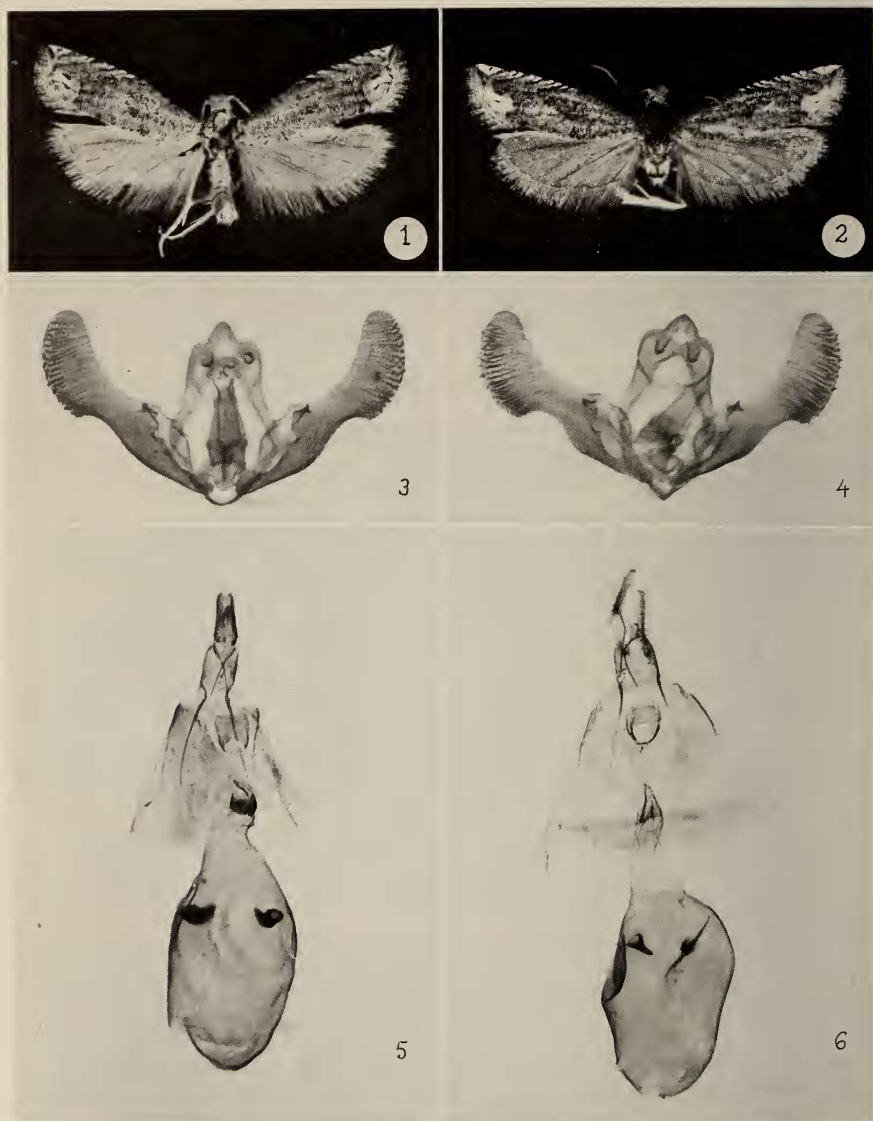
Kearfott's description of *E. minutana* states that *minutana* is of very much smaller size than *strenuana* and that the forewings are much narrower than *strenuana*—more than three times as long as wide. As our Padre Island specimens presented these two characters, I requested help of the National Museum of Natural History and the American Museum of Natural History which have most of Kearfott's types of *E. minutana*.

Kearfott described *minutana* from a series of about 40 specimens, 15 of which are before me: 9 from NMNH and 6 from AMNH. I eliminate from consideration one of the specimens borrowed from NMNH because, although labelled type by Kearfott, it does not appear to be conspecific with the other fourteen.

These fourteen types made a remarkably homogeneous group and my small, narrow-winged specimens from Padre Island, as well as some of my smallest "*strenuana*" go very well with them. Figs. 2, 4, 6, 9, and 10 permit easy comparison of Kearfott's types with some recently collected specimens. I do not include here a list of the Texas material examined in this study.

Description of female. Table 1 summarizes data for 22 dissected females. Among the females two characters are practically diagnostic: (i) the diameter at base of the signa, and (ii) the shape of the lamella postvaginalis. The signa are two hollow, curved, thornlike, sclerotized processes flattened at their distal end, round at their base. It is almost always easy to accurately measure their base diameter. Signa of both groups of specimens are about the same size, but they average larger (with no overlap in size) in *strenuana* than in *minutana*. The lamella postvaginalis is also consistently different. In *strenuana* it is longer in proportion to width and its sides are straight and parallel; in *minutana* the sides diverge caudad. Table 1 shows that there is overlap in forewing length as well as in forewing length-to-width ratio. The corpus bursae size and shape are not very good characters either, although the *minutana* corpus bursae may be more pear-shaped, less bulbous than that of *strenuana*.

Description of male. There appears to be little difference between males and females regarding wing size and forewing length-to-width ratio (Table 2). Some males will prove difficult to identify: size and length-to-width ratio are good characters if they do not fall in the range of overlap. When both these characters fail, one may rely on the size of genitalia or the shape of the valves: the neck incurvation of the valves of *minutana* is usually shallower than that of *strenuana*.



FIGS. 1-6: *Epiblema minutana*. 1, ♂ lectotype; 2, ♂ specimen from No. Padre Island, Nueces Co., 27 July 1978; 3, genitalia of lectotype, slide U.S.N.M. 24505; 4, genitalia of specimen of Fig. 2, slide A.B. 4473; 5, ♀ genitalia of lectoparatype, Montclair, New Jersey, July 8, slide U.S.N.M. 24501; 6, genitalia of a ♀ specimen from No. Padre Island, 8 July 1978, slide A.B. 4507.

TABLE 1. Comparison of measurements on dissected female specimens of *Epiblema minutana* and *E. strenuana*. Measurements are given as the median (and range).

Species	Forewing length ¹	Forewing length:width ratio	Corpus bursae length:width ¹	Sigma base diameter ¹
<i>Epiblema minutana</i> , 11 specimens	5.6 (4.7-6.3)	3.1 (2.8-3.35)	1.15; 0.85 (0.95; 0.5-1.45; 1.0)	0.08 (0.07-0.11)
<i>Epiblema strenuana</i> , 11 specimens	7.8 (5.6-8.8)	2.65 (2.5-2.95)	1.45; 1.25 (1.0; 1.2-1.8; 1.25)	0.14 (0.12-0.18)

¹ Measurements given in millimeters.

Foodplant. The foodplant of *E. minutana*, according to Forbes (1923: 413) is *Ambrosia artemisiifolia* and I am convinced that, when better known, *E. minutana* will prove to be as widely distributed as its foodplant.

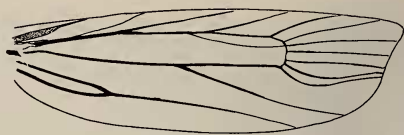
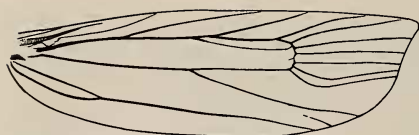
Type data. Lectotype, hereby designated, ♂, Montclair, New Jersey, 8 July. Genitalia on slide USNM 24505 (Figs. 1, 3 & 7). **Lectoparatypes:** ♀, Montclair, New Jersey, 8 July; left pair of wings and genitalia on slide USNM 24501 (Figs. 5, 8). ♂, Tryon, North Carolina, 23 May 1904, Fiske collector, right pair of wings and genitalia on slide USNM 24506. ♂, Tryon, North Carolina, 24 May 1904, Fiske collector, the metathorax and hind wings have, somewhat improperly, been glued. ♂, Cincinnati, Ohio, 10 July 1904, Annette Braun, abdomen missing. ♀, Plummer's I., Maryland, July, Aug. Busck, abdomen and antennae missing. ♂, New Brighton, Pennsylvania, 20 May 1903, H. D. Merrick, abdomen and some of both antennae missing. ♀, 440 L iss. 11 Jan. 1901, LHW missing. All of these are in NMNH. ♂, Essex County Park, New Jersey, 13 Aug.,

TABLE 2. Forewing measurements on fourteen of Kearfott's types of *Epiblema minutana*.

Type specimen		Forewing	
Museum	Sex & number	Length ¹ (mm)	Length-to-width ratio ²
NMNH	♂ 1 (USNM 24505)	4.9	3.3
	♂ 3 (USNM 24506)	5.6	3.55
	♂ 4	6.1	3.5
	♂ 5	5.5	3.5
	♂ 7	6.1	3.5
AMNH	♂ 1	6.1	3.2
	♂ 2	5.3	3.2
	♂ 3	4.9	2.95
	♂ 5	5.4	2.8
NMNH	♀ 2	5.4	3.45
	♀ 6	5.6	3.35
	♀ 8	6.1	3.2
AMNH	♀ 4	5.5	3.3
	♀ 6	5.4	3.25

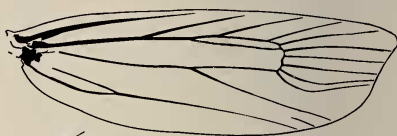
¹ Mean for males—5.55 mm; for females—5.6 mm

² Mean for males—3.25; for females—3.30



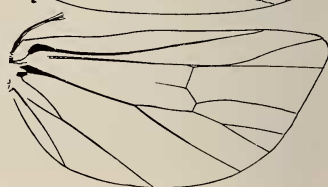
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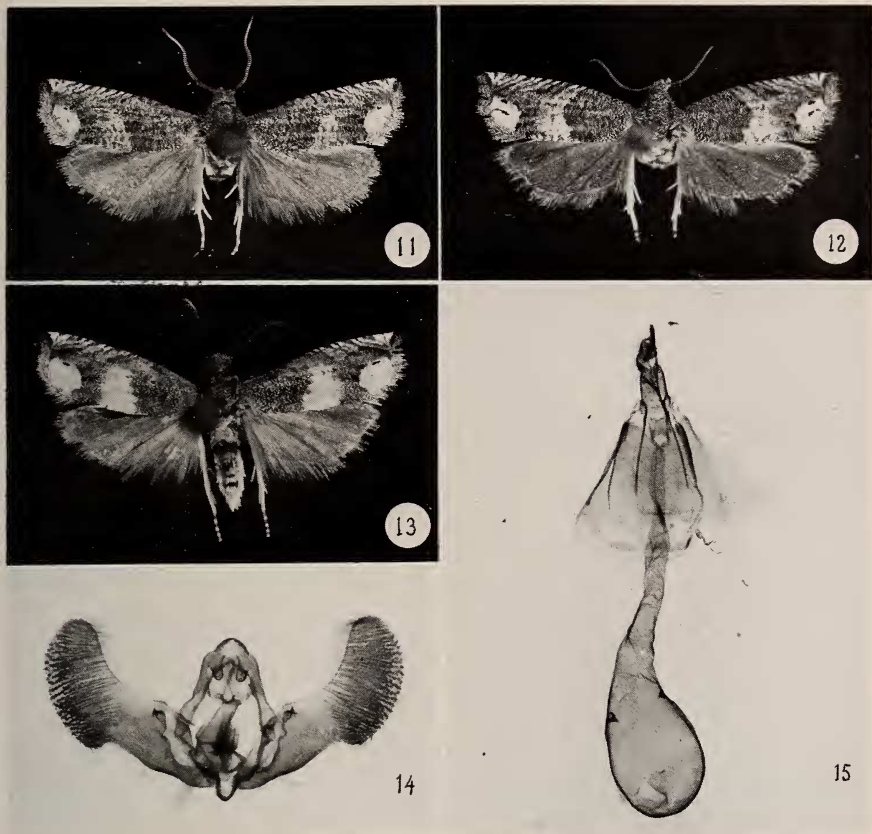
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FIGS. 7-10, 16, 17: *Epiblema* venation. Figs. 7-10: *E. minutana*, 7, ♂ lectoparatype, slide U.S.N.M. 24506; 8, ♀ lectoparatype, slide U.S.N.M. 24501; 9, ♂ from No. Padre Island, 6 April 1978, slide A.B. 4472; 10, ♀ from same date and location, slide A.B. 4465. Figs. 16, 17: *E. luctuosana*. 16, ♂ paratype from Padre Island National Seashore, 24 June 1976, slide A.B. 4269; 17, ♀ paratype of Fig. 15, slide A.B. 4521.



FIGS. 11-15: *Epiblema luctuosana*. 11, ♂ holotype; 12, ♀ paratype, No. Padre Island, 9 June 1978; 13, ♂ paratype, No. Padre Island, 5 June 1978; 14, genitalia of holotype, slide A.B. 4468; 15, genitalia of a ♀ paratype, No. Padre Island, 5 June 1978, slide A.B. 4521.

trap, W. D. Kearfott, in good condition, No. 34716. ♂, Essex County Park, New Jersey, 20 Aug., trap, W. D. Kearfott, head missing, otherwise in good condition, No. 34716. Essex County Park, New Jersey, 20 July, trap, W. D. Kearfott, abdomen missing, No. 34716, Female, Wilkesbarre, Pennsylvania, 6 June, W. D. Kearfott, genitalia on slide A.B. 4598. ♂, Montclair, New Jersey, u. m. s. 10 May, W. D. Kearfott, mildewed, Ac. 4667. ♀, Cincinnati, O., 18 June 1904, Annette Braun, traces of mildew, Ac. 4667. All six lectoparatypes are in AMNH.

Some material collected by A. & M. E. Blanchard, discussed above will be deposited in NMNH and AMNH. All the females collected by A. & M. E. Blanchard, described in Table 1 will (together with their genitalia slides) be deposited in NMNH.

I have been advised by a reviewer of this article that Richard L. Brown (1973:58) in his unpublished Masters thesis had already listed *E. minutana* as a species. It is a pleasure to give him credit here.

***Epiblema luctuosana* A. Blanchard, n. sp.**

Description. Palpi exceeding front by a little less than an eye diameter, third segment smoothly scaled, almost completely hidden in the loose, grayish scaling of the much longer second segment. Antennae simple, ciliate beneath, the sensory hairs hardly exceeding the scales. Male and female venation is shown in Figs. 16 and 17; maculation shown in Figs. 11, 12 and 13. Nearly all the scales, except the whitish ones of the ocelloid patch and those of the whitish patch at the middle of the dorsum are black or blackish basally, white or whitish distally, without appreciable transition: this is true, not only of the wing and body scales, but even of those which clothe the palpi, the antennae and the legs. It gives this insect a pepper-and-salt appearance which is most noticeable under the microscope at low magnification. The size and appearance of the ocelloid patch varies little but the whitish patch near the middle of the dorsum varies considerably, from very large (Fig. 13) to almost obsolete (Fig. 11), to completely obsolete. Hind wing dark fuscous.

Wing expanse: males 9.3–13.5, mean = 12 mm; females 11.8–13.6 mm, mean = 12.7 mm.

Male genitalia (Fig. 14). From the holotype, slide A.B. 4468.

Female genitalia (Fig. 15). Slide A. B. 4521, paratype from North Padre Island, Nueces Co., Texas, 5 June 1978. Ductus seminalis from ductus bursae somewhat closer to genital opening than to corpus bursae. Signa very small, conical.

Type data. Holotype (Fig. 11): ♂, North Padre Island, Nueces Co., Texas, 6 April 1978, genitalia on slide A.B. 4468 (Fig. 14), deposited in NMNH (type No. 75822).

Paratypes: (All localities in Texas) 3 ♀♀, Houston, 5–6 June 1968; ♀, Deutschburg, Jackson Co., 2 Aug. 1972; Santa Ana Refuge, 27 Nov. 1973, ♂; 4 Nov. 1974, ♂; Sinton, Welder Refuge, San Patricio Co.; 30 June 1975, ♀; North Padre Island, either Nueces Co., or National Seashore, Kleberg Co., 22 April 1976, ♂; 19 May 1976, ♂, 4 ♀♀; 24 June 1976, 2 ♂♂; 19 July 1976, ♂; 20 May 1977, ♂; 18–21 June 1977, 3 ♂♂, 3 ♀♀; 6 April 1978, 2 ♂♂; 5–10 June 1978, 16 ♂♂, 9 ♀♀; ♂, Conroe, Camp Strake, Montgomery Co., 14 Sept. 1977; ♀, Eagle Lake, Attwater Prairie Chicken Refuge, Colorado Co. The paratypes are in the author's collection.

I am indebted to Richard L. Brown for examining some of my specimens and slides and I quote him (*in litt.*) regarding the relationships of *luctuosana* to other *Epiblema* species: "E. *luctuosana* appears to be related with the species *numerosana* (Zeller), *praesumptiosa* Heinrich, *grossbecki* Heinrich, *abruptana* (Walsingham) and *deflexana* Heinrich. This group of species lacks sclerotization of the female ductus bursae (female of *deflexana* not examined) and has longer coronal setae on the cucullus relative to other *Epiblema* species. This group is also characterized by the vinculum depth exceeding the tegumen length and the presence of black scales on the labial palpi. E. *luctuosana* shares the above characters with this species group, but is distinguished by the absence of black scales on the labial palpi."

***Sonia paraplesiana* A. Blanchard, n. sp.**

Head. Front clay yellow; vertex pale brown; first and second segments of palpi shaggily squamous underneath, with a laterally compressed brush of long, clay yellow, brown dotted scales; third segment smoothly scaled, more than half hidden in scaling of second segment, brown with clay yellow tip. Antennae simple, shortly pubescent, brownish.

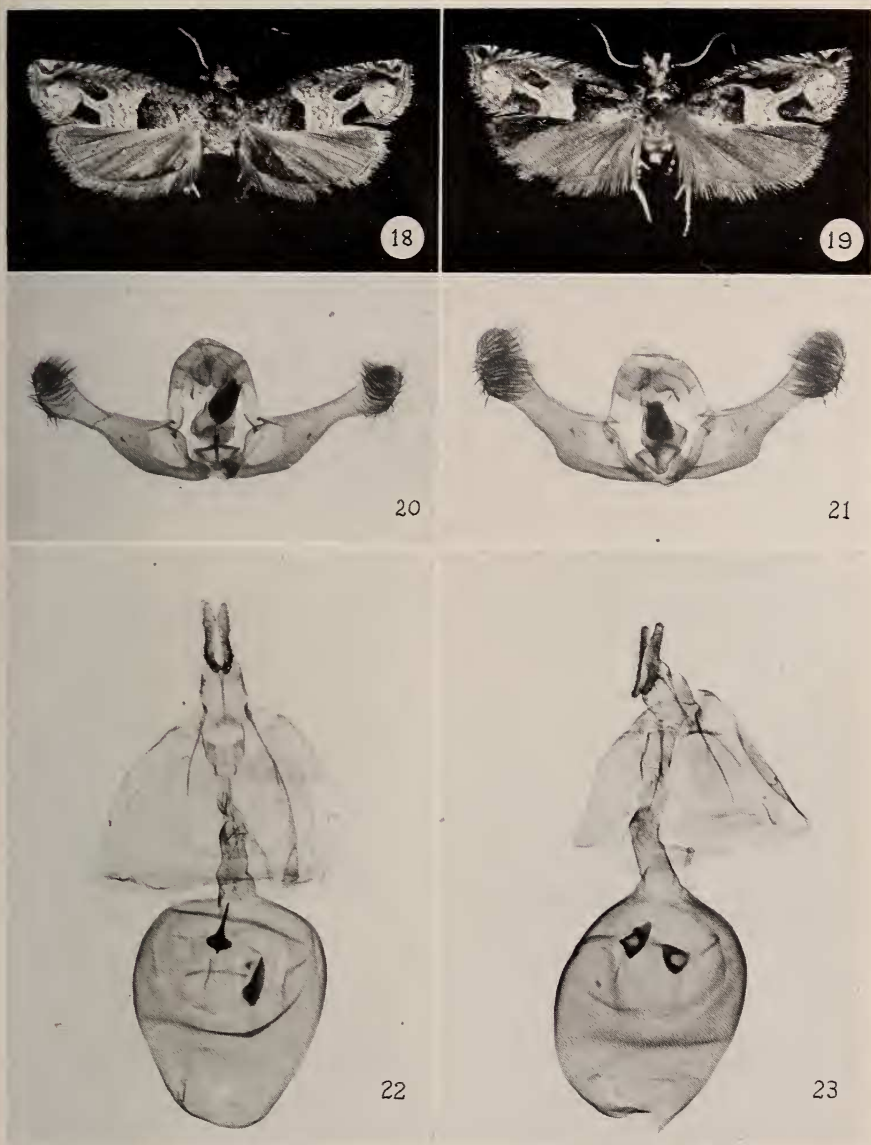
Maculation. As in Fig. 18, the color from dark fuscous brown to similarly tinted whitish. Wing venation: Figs. 24 and 25; the length of the stalk of veins R_s and M_1 of the hind wing varies from short to about half as long as their free parts, but these two veins appear to be consistently stalked.

Wing expanse. 12.5–17 mm.

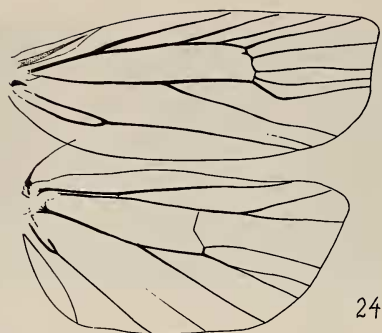
Male genitalia. As in Fig. 20.

Female genitalia. As in Figs. 22 and 26.

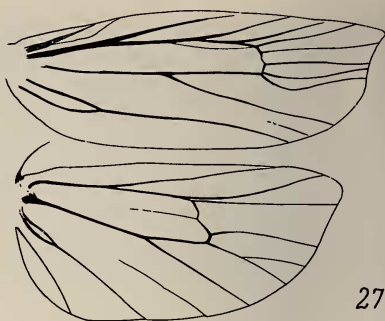
Type data. Holotype: ♂, Houston, Texas, 5 June 1968, genitalia on slide A.B. 4365,



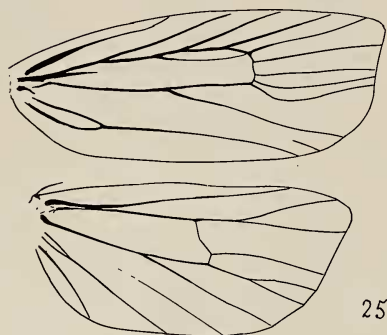
FIGS. 18-23: *Sonia* species. Figs. 18, 20, 22: *S. paraplesiana*. 18, holotype; 20, ♂ genitalia of a paratype, Houston, Texas, 8 June 1968, slide A.B. 4524; 22, ♀ genitalia of a paratype, Sinton, Texas, Welder Wildlife Refuge, 2 June 1978, slide A.B. 4512. Figs. 19, 21, 23: *S. constrictana*. 19, ♂ from Welder Refuge, 30 June 1975; 21, ♂ genitalia of a specimen from Santa Ana National Refuge, Texas, 15 September 1974, slide A.B. 4523; 23, ♀ genitalia of a specimen from Welder Refuge 30 June 1975, slide A.B. 4520.



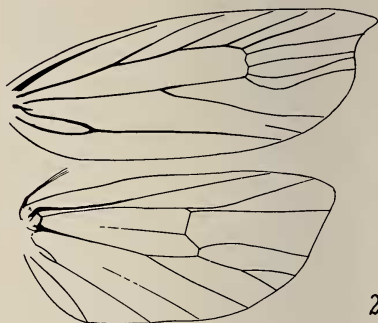
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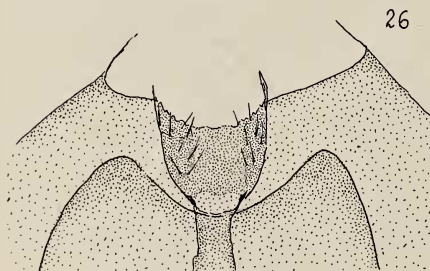
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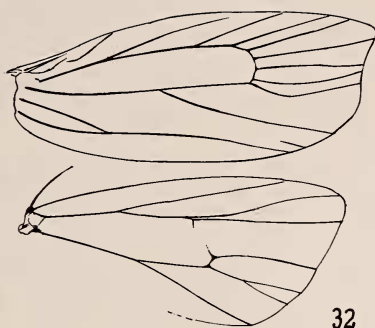
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FIGS. 24-29: *Sonia* species. Figs. 24, 25: *S. paraplesiana* venation. 24, ♂ paratype, slide A.B. 0892; 25, ♀ paratype, slide A.B. 4512. Figs. 27, 28: *S. constrictana* venation. 27, ♂, slide A.B. 4283; 28, ♀, slide A.B. 4358. Figs. 26, 29: lamella postvaginalis: 26, *S. paraplesiana*, ♀ paratype, slide A.B. 4512; 29, *S. constrictana*, ♀, slide A.B. 4360.

deposited in NMNH, No. 76098. **Paratypes:** Houston, Texas, 21 June 1966, ♂; 26 August 1966, ♂; 7 November 1966, ♂; 4, 5 June 1967, 2 ♂♂; 5-8 June 1968, 7 ♂♂, ♀; ♀, Sinton, Welder Wildlife Refuge, San Patricio Co., Texas, 30 June 1975; ♀, Town Bluff, Tyler Co., Texas, 15 Sept. 1975; 2 ♂♂, Tennessee Colony, Anderson Co., Texas 25 June 1978; A. & M. E. Blanchard collectors. Specimens presently are in the author's collection.



FIGS. 30-32: *Sonia constrictana*. 30, ♂ holotype; 31, genitalia, slide V. Adams XII.4.69; 32, venation of right pair of wings, same slide.

The following paratypes are in the National Museum: Putnam Co., Illinois, 26 June 1964, ♂; 2 July 1964, ♂; 1 July 1965, ♂; 25 June 1966, ♂; 7 July 1970, ♀; M. O. Glenn collector. 2 ♂♂, Cornell University, Ithaca, New York, 16 June 1957, D. R. Davis collector. ♂, McLean Bogs Reserve, Tompkins Co., New York, 20 July 1957, J. G. Franclemont collector. ♂, Long Island, New York, no date, Coll. G. P. Engelhardt. Martha's Vineyard, Mass., no date, ♂; 17 Aug. 1943, ♂, F. M. Jones collection. ♂, ♀, Oak Station, Alleg. Co., Pa., 4-5 Aug. 1908, Fred Marloff collector. Oneco, Manatee Co., Florida, 28 March 1954, ♀; 23 March 1957, ♀; ♂, Archbold Bio. Sta., Highlands Co., Florida, 27 March 1959, J. G. Franclemont collector. Same location, 28 March 1959, ♂; 30 April 1964, 3 ♂♂, 3 ♀♀, R. W. Hodges collector.

North Oaks, Ramsey Co., Minnesota, 7 July 1965, ♂; 16 July 1965, ♂; 20 August 1965, ♂; W. E. Miller collector, in North Central Experiment Station, Saint Paul, Minnesota. ♂, Livingston Co., Michigan, 22 July 1946, John H. Newman collector, in Michigan State University. Bay City State Park, Bay Co., Michigan, 17 July 1935, ♀; Midland Co., 15 July 1935, ♂, A. Olson & L. K. Gloyd collectors, in University of Michigan.

Remarks. Nineteen slides, including nineteen genitalia and ten pairs of wings, have been prepared. These were compared with eighteen slides, including eighteen genitalia and eight pairs of wings, of *Sonia constrictana*.

Sonia paraplesiana is extremely close to *Sonia constrictana* described by Zeller (1875) from a single male, now in the Museum of Comparative Zoology. This holotype bears the following labels: 1, Dallas, Texas, Boll; 2, a green label with the hand-written name *Paedisca* (?) *constrictana*; 3, MCZ type No. 14335; 4, Wings and genitalia on slide V. Adams XII.4.69.

Sonia paraplesiana closely resembles *S. constrictana*. Zeller's type (its genitalia and venation as in Figs. 30, 31, 32) respectively agrees very well with Figs. 18, 20 and 24.

The main characters by which the two species can be differentiated are as follows:

the outer margin of the forewing of *paraplesiana* is slightly concave between veins M_1 and Cu_1 and the apex is broadly rounded; in *constrictana* the outer margin is more concave between the same veins and the apex is pointed. *Sonia constrictana* shows near the apex of the forewing a small ocellus-like spot which on the better marked specimens is blackish and surrounded with yellowish brown. *S. paraplesiana* is normally darkened at the apex of the forewing, but there is no ocellus-like spot there. Veins R_s and M_1 of the hind wing are stalked in *paraplesiana* and the length of the stalk varies from very short to half as long as the free part of these veins. In *constrictana* these veins vary from contiguous to separate and closely parallel for some distance out of the cell.

The tegumen length of the male genitalia is about equal to the vinculum depth in *constrictana*, and greater in *paraplesiana*; the ventral margin of the valva has a shallow neck incurvation in *paraplesiana*, the neck incurvation is deeper in *constrictana* and basad of it the margin is bluntly angled. In the female genitalia, the lamella postvaginalis of *paraplesiana* is wider than long and its margins diverge caudad; it is narrower than long in *constrictana* and its margins are subparallel. The ventral signum of *paraplesiana* is caudad of the dorsal one, they are at about the same level in *constrictana*. The signa of *constrictana* appear on average, bigger than those of *paraplesiana*.

Distribution. *Sonia paraplesiana* probably inhabits the territory which was indicated by Heinrich for *Sonia constrictana*: Florida, Texas, North Carolina, Kentucky, Illinois, Iowa, South Dakota, District of Columbia, Pennsylvania, New Jersey. We can now add Massachusetts, Michigan, Minnesota, and New York. *Sonia constrictana* is more southern: except for one specimen from Putnam Co., Illinois (M. O. Glenn, 1 August 1970, in NMNH), I have seen only specimens from Florida and Texas, where it is sympatric with *paraplesiana* and where both species are sometimes taken together.

ACKNOWLEDGMENTS

This paper was made possible through the kind cooperation of many people: Dr. J. F. G. Clarke, Dr. F. H. Rindge, Dr. R. Silberglied, Dr. W. E. Miller generously responded to my request for specimens and types. I am also indebted to Richard L. Brown for comparing some of my specimens with those in the National Museum and for several useful comments. I am particularly grateful to Dr. Clarke for his continued interest and support in this project.

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